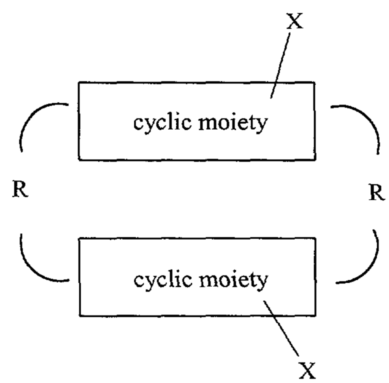
We Claim:

1. A method of forming a precursor for use in manufacturing integrated circuits comprising the steps of:

providing a quantity of an antireflective compound and a substrate having a surface onto which said compound is to be applied, said antireflective compound having the formula



wherein:

R represents a linkage group; and

each X is individually selected from the group consisting of hydrogen, the halogens, nitro groups, amino groups, acetamido groups, substituted and unsubstituted cyclic and heterocyclic groups, and COR^1, where R^1 is selected from the group consisting of hydrogen, substituted and unsubstituted phenyl groups, substituted and unsubstituted alkyl groups, cinnamoyl, naphthoyl, acryloyl, methacryloyl, furoyl, and thiophenecarbonyl groups; and

subjecting said antireflective compound to a chemical vapor deposition process so as to deposit said antireflective compound in a layer on said substrate surface.

2. The method of claim 1, further including the step of applying a photoresist layer to said antireflective compound layer.

3. The method of claim 1, wherein at least one of said cyclic moieties is heterocyclic or aromatic.

4. The method of claim 3, wherein said cyclic moieties are selected from the group consisting of benzene, naphthalene, anthracene, phenanthrene, pyrene, pyridine, pyridazine, pyrimidine, pyrazine, thiazole, isothiazole, oxazole, isooxazole, thiophene, furan, and pyrrole.

5. The method of claim 1, wherein the strain energy of said antireflective compound is at least about 10 kcal/mol.

6. The method of claim 1, wherein said substrate comprises a silicon wafer.

7. The method of claim 1, wherein said chemical vapor deposition process comprises the steps of:

(a) subjecting said antireflective compound to a sufficient temperature and pressure to form said antireflective compound into a vapor;

(b) cleaving the resulting vaporized compound; and

(c) depositing said cleaved compound onto said substrate surface.

8. The method of claim 7, wherein said subjecting step (a) is carried out at a temperature of from about 35-160°C and a pressure of from about 2-50 mTorr.

9. The method of claim 7, wherein said cleaving step (b) comprises breaking a bond between two of the atoms of each R.

10. The method of claim 7, wherein said cleaving step (b) comprises pyrolizing said antireflective compound.

11. The method of claim 10, wherein said pyrolizing step comprises heating said antireflective compound to a temperature of from about 580-700°C.

12. The method of claim 7, wherein said causing step (c) comprises subjecting said cleaved compound to a temperature of from about 20-25°C.

13. The method of claim 1, wherein said antireflective compound layer is substantially insoluble in solvents utilized in said photoresist layer.

14. The method of claim 1, further including the steps of:

exposing at least a portion of said photoresist layer to activating radiation;

developing said exposed photoresist layer; and

etching said developed photoresist layer.

15. The method of claim 1, wherein the antireflective compound layer deposited on said substrate surface absorbs at least about 90% of light at a wavelength of from about 150-500 nm.

16. The method of claim 1, wherein the antireflective compound layer deposited on said substrate surface will be subjected to light of a predetermined wavelength and has a k value of at least about 0.1 at said predetermined wavelength.

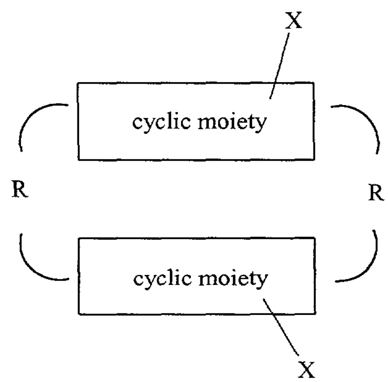
17. The method of claim 1, wherein the antireflective compound layer deposited on said substrate surface has a percent conformality of at least about 85%.

18. The method of claim 1, wherein said substrate comprises raised features and structure defining contact or via holes, and said subjecting step comprises depositing a quantity of said antireflective compound in a layer on said features and said hole-defining structure.

19. A precursor structure formed during the course of the integrated circuit manufacturing process, said structure comprising:

a substrate having a surface; and

a layer comprising an antireflective compound on said surface, said antireflective compound layer being formed on said surface by a chemical vapor deposition process and said antireflective compound comprising a polymer being formed from monomers having the formula



wherein:

R represents a linkage group; and

each X is individually selected from the group consisting of the hydrogen, the halogens, nitro groups, amino groups, acetamido groups, substituted and unsubstituted cyclic and heterocyclic groups, and COR^1, where R^1 is selected from the group consisting of hydrogen, substituted and unsubstituted phenyl groups, substituted and unsubstituted alkyl groups, cinnamoyl, naphthoyl, acryloyl, methacryloyl, furoyl, and thiophenecarbonyl groups.

20. The structure of claim 19, said structure further comprising a photoresist layer on said antireflective compound layer.

21. The structure of claim 19, wherein at least one of said cyclic moieties is heterocyclic or aromatic.

22. The method of claim 21, wherein said cyclic moieties are selected from the group consisting of benzene, naphthalene, anthracene, phenanthrene, pyrene, pyridine, pyridazine, pyrimidine, pyrazine, thiazole, isothiazole, oxazole, isooxazole, thiophene, furan, and pyrrole.

23. The method of claim 19, wherein the strain energy of said antireflective compound is at least than about 10 kcal/mol.

24. The method of claim 19, wherein said substrate comprises a silicon wafer.

25. The method of claim 19, wherein the antireflective compound layer on said substrate surface has a thickness of from about 300-5000 Å.

26. The method of claim 19, wherein said antireflective compound layer is substantially insoluble in solvents utilized in said photoresist layer.

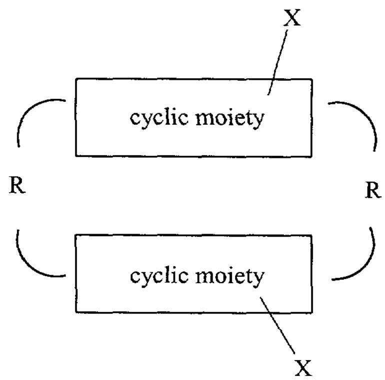
27. The method of claim 19, wherein the antireflective compound layer absorbs at least about 90% of light at a wavelength of from about 150-500 nm.

28. The method of claim 19, wherein the antireflective compound layer, when subjected to light of a predetermined wavelength, has a k value of at least about 0.1 at said predetermined wavelength.

29. The method of claim 19, wherein the antireflective compound layer has a percent conformality of at least about 85%.

30. The method of claim 19, wherein said substrate comprises raised features and structure defining contact or via holes and said antireflective layer is on at least some of said features and said hole-defining structure.

31. A light attenuating compound having the formula



wherein:

R represents a linkage group; and

each X is individually selected from the group consisting of hydrogen, the halogens, nitro groups, amino groups, acetamido groups, substituted and unsubstituted cyclic and heterocyclic groups, and COR^1, where R^1 is selected from the group consisting of hydrogen, substituted and unsubstituted phenyl groups, substituted and unsubstituted alkyl groups, cinnamoyl, naphthoyl, acryloyl, methacryloyl, furoyl, and thiophenecarbonyl groups; and

when both cyclic moieties are naphthalene, each X is individually selected from the group consisting of the halogens, nitro groups, amino groups, acetamido groups, and carbonyls.

32. The compound of claim 31, wherein each cyclic moiety is selected from the group consisting of naphthalene, anthracene, thiophene, and pyridine.

33. The compound of claim 30, wherein said X is COR^1, and R^1 is selected from the group consisting of phenyl, methyl phenyl, methoxyphenyl, nitro-phenyl, cinnamoyl, naphthoyl, acryloyl, methacryloyl, furoyl, and thiophenecarbonyl groups.

34. The compound of claim 33, wherein each R comprises ethyl groups.

35. The compound of claim 32, wherein each R comprises ethyl groups.

36. A method of forming a light attenuating compound comprising the steps of:

reacting at least two cyclic compounds with a halogenating agent in the presence of a catalyst and a solvent so as to halogenate the cyclic compounds; and

reacting the cyclic compounds so as to yield an antireflective compound comprising two cyclic moieties joined via a linkage group bonded both to a first location on one of the cyclic moieties and to a first location on the other of the cyclic moieties.

37. The method of claim 36, wherein said halogenating agent is selected from the group consisting of brominating and chlorinating agents.

38. The method of claim 37, wherein said halogenating agent is *N*-bromosuccinimide.

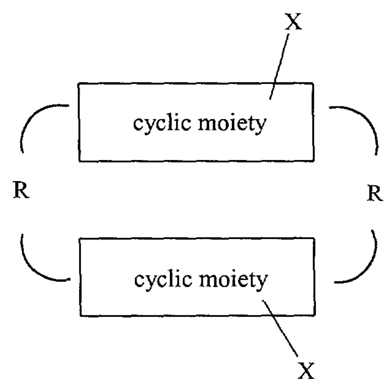
39. The method of claim 36, wherein said catalyst is benzoyl peroxide.

40. The method of claim 36, wherein said solvent is carbon tetrachloride.

41. The method of claim 36, wherein said catalyst is cetyltrimethylammoniumbromide and said first reacting step is also carried out in the presence of an alkyl-donating compound capable of reacting with the cyclic compounds so as to add a C_2 or higher alkyl group to each of said cyclic compounds.

42. The method of claim 41, wherein said alkyl-donating compound is paraformaldehyde.

43. The method of claim 36, wherein the antireflective compound formed in said second reacting step has the formula



wherein:

R represents a linkage group; and

each X is individually selected from the group consisting of hydrogen, the halogens, nitro groups, amino groups, acetamido groups, substituted and unsubstituted cyclic and heterocyclic groups, and COR^1, where R^1 is selected from the group consisting of hydrogen, substituted and unsubstituted phenyl groups, substituted and unsubstituted alkyl groups, cinnamoyl, naphthoyl, acryloyl, methacryloyl, furoyl, and thiophenecarbonyl groups.

44. A method of forming a precursor for use in manufacturing integrated circuits comprising the steps of:

providing a quantity of an antireflective compound and a substrate having a surface onto which said compound is to be applied;

subjecting said antireflective compound to a chemical vapor deposition process so as to deposit said antireflective compound in a layer on said substrate surface; and

applying a photoresist layer to said antireflective compound layer to yield the circuit precursor.

45. The method of claim 44, wherein said antireflective compound comprises two cyclic moieties joined together by at least one alkyl group, wherein said alkyl group comprises from about 2-4 carbon atoms.

46. The method of claim 45, wherein at least one of said cyclic moieties is aromatic.

47. The method of claim 46, wherein said aromatic moieties are individually selected from the group consisting of benzene, naphthalene, anthracene, thiophene, furan, and pyrrole moieties.

48. The method of claim 47, wherein at least one of said aromatic moieties is benzene.

49. The method of claim 48, wherein said compound is 1,4-dixylylene.

50. The method of claim 45, wherein said alkyl group is an ethyl group.

51. The method of claim 45, wherein the strain energy of said compound is at least than about 10 kcal/mol.

52. The method of claim 44, wherein said substrate comprises a silicon wafer.

53. The method of claim 45, wherein said chemical vapor deposition process comprises the steps of:

(a) subjecting said compound to a sufficient temperature and pressure to form said compound into a vapor;

(b) cleaving the resulting vaporized compound; and

(c) depositing said cleaved compound on said substrate surface.

54. The method of claim 53, wherein said subjecting step (a) is carried out at a temperature of from about 35-160°C and a pressure of from about 2-50 mTorr.

55. The method of claim 53, wherein said cleaving step (b) comprises breaking a bond between two of the carbon atoms of said alkyl group.

56. The method of claim 53, wherein said cleaving step (b) comprises pyrolizing said compound.

57. The method of claim 56, wherein said pyrolizing step comprises heating said compound to a temperature of from about 580-700°C.

58. The method of claim 53, wherein said causing step (c) comprises subjecting said cleaved compound to a temperature of from about 20-25°C.

59. The method of claim 44, wherein the antireflective compound layer on said substrate surface after said applying step has a thickness of from about 300-5000 Å.

60. The method of claim 44, wherein said antireflective compound layer is substantially insoluble in solvents utilized in said photoresist layer.

61. The method of claim 44, further including the steps of:

exposing at least a portion of said photoresist layer to activating radiation;

developing said exposed photoresist layer; and

etching said developed photoresist layer.

62. The method of claim 44, wherein the antireflective compound layer deposited on said substrate surface absorbs at least about 90% of light at a wavelength of from about 150-500 nm.

63. The method of claim 44, wherein the antireflective compound layer deposited on said substrate surface will be subjected to light of a predetermined wavelength and has a k value of at least about 0.1 at said predetermined wavelength.

64. The method of claim 44, wherein the antireflective compound layer deposited on said substrate surface has a percent conformality of at least about 85%.

65. The method of claim 44, wherein said substrate comprises raised features and structure defining contact or via holes, and said subjecting step comprises depositing a quantity of said antireflective compound in a layer on said features and said hole-defining structure.

66. The method of claim 44, wherein said antireflective compound has the structure of Formula II.

67. A precursor structure formed during the course of the integrated circuit manufacturing process, said structure comprising:

a substrate having a surface;

a layer comprising an antireflective compound on said surface, said antireflective compound layer being formed on said surface by a chemical vapor deposition process; and

a photoresist layer on said antireflective compound layer.

68. The structure of claim 67, wherein said antireflective compound comprises two cyclic moieties joined together by at least one alkyl group, said alkyl group comprising from 2-4 carbon atoms.

69. The structure of claim 68, wherein at least one of said cyclic moieties is aromatic.

70. The structure of claim 69, wherein said aromatic moieties are individually selected from the group consisting of benzene, naphthalene, anthracene, thiophene, furan, and pyrrole moieties.

71. The structure of claim 70, wherein at least one of said aromatic moieties is benzene.

72. The structure of claim 71, wherein said compound is 1,4-dixylylene.

73. The structure of claim 68, wherein said alkyl group is an ethyl group.

74. The structure of claim 68, wherein the strain energy of said compound is at least about 10 kcal/mol.

75. The structure of claim 67, wherein said substrate comprises a silicon wafer.

76. The structure of claim 67, wherein the antireflective compound layer on said substrate surface has a thickness of from about 300-5000 Å.

77. The structure of claim 67, wherein said antireflective compound is substantially insoluble in solvents utilized in said photoresist layer.

78. The structure of claim 67, wherein the antireflective compound layer deposited on said substrate surface absorbs at least about 90% of light at a wavelength of from about 150-500 nm.

79. The structure of claim 67, wherein the antireflective compound layer deposited on said substrate surface will be subjected to light of a predetermined wavelength and has a k value of at least about 0.1 at said predetermined wavelength.

80. The structure of claim 67, wherein the antireflective compound layer deposited on said substrate surface has a percent conformality of at least about 85%.

81. The structure of claim 80, wherein said substrate comprises raised features and structure defining contact or via holes and said antireflective compound layer is deposited on said features and said hole-defining structure.

82. The structure of claim 67, wherein said antireflective compound has the structure of Formula II.